

# A Study on MALARIA CONTROL PROGRAM (MCP) in East Lombok, Indonesia:

In-Depth Interview and Collecting Baseline Data and  
Epidemiological/Sociological Survey (CBDESS)

—— Part. 1 ——

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## 〔抄 録〕

マラリアは、21世紀の地球社会において毎年2～3億人の患者と150～200万人の死者、すなわち、毎日およそ3000人もの死者をだす最悪の感染症の一つである。マラリアは単なる疾病ではない。主たる感染地域である途上国では、医療健康問題のみならず、持続可能な発展にとって大きな障害となっている。マラリア問題の根底には、医学的な要因だけではなく、劣悪な衛生環境や栄養状態、経済的貧困、社会関係資本不足、ジェンダー差別、教育欠如などの人間貧困の悪循環からくる「生存権の剥奪状況」がある。本研究は、環境社会学の視点からマラリアを蔓延させる生存権の剥奪状況を解明するための社会疫学的研究を目指している。

2005年のインドネシアでは、異常気象によって雨季(11月から3月)に激しい集中豪雨が襲った。その洪水がハマダラ蚊(マラリア蚊)の大発生を引き起こし、マラリア感染症がインドネシア各地で爆発的に蔓延した。とくにロンボク島では、2万人以上がマラリアに罹患し、千人以上の死者が出て、地域医療体制が機能不全に陥る「マラリア・アウトブレイク」が生じた。2005年のマラリア・アウトブレイクでは、1)地球気候変動による集中豪雨が、ハマダラ蚊の異常発生原因といわれていること(気候変動要因)、2)森林やラグーンの乱開発で、蚊の生息環境が居住地域周辺に隣接したこと(自然破壊要因)、3)都市化・工業化に伴って、労働力移動が顕著になり、マラリア患者(キャリアを含めて)の拡散が急速かつ、広範囲になったこと(経済社会的要因)など、従来のマラリア疾病対策では、十分に言及されなかった医学的要因以外の、とくに社会変化に伴う諸要因の重要性が認識されるようになった。

2005年のマラリア・アウトブレイクによって、伝統的なマラリア対策の限界が露呈し、その根本的な再検討の必要性が議論されている。マラリア対策の中心である、発生源のハマダラ蚊の撲滅(生息環境の埋め立てや浄化、薬剤散布など)と、マラリア患者に対する医学的処方、とくに「早期発見・適正医療」だけでは、マラリア撲滅は不可能だけでなく、今後ますます感染拡大が予想される。いいかえると、

マラリア・アウトブレイクとマラリア患者をめぐる「生存権の剥奪状況」を分析する社会疫学的研究が必要となっている。とくにマラリア発生メカニズムに関する医学的知見とマラリア感染の社会・文化要因をも含めた社会学的解明にもとづく、新しい社会的疫学的なマラリア総合対策が必要とされている。

このような科学的かつ社会的な要請のもと、マタラム大学医学部マリヤント教授チームと佛教大学社会学部満田教授グループは、2006年から3カ年計画で国際共同研究「マラリア・コントロール・プログラム (MCP)」を発足させた。

本稿は、マラリア・アウトブレイクをめぐる経済・社会・政治・文化的要因の相互関係を明らかにするために、東ロンボク島の3つの地域で実施した宗教的指導者・地方政府役人・医者・看護師・学校関係者・社会活動家・主婦などのインタビューと第2次的資料の分析にもとづく「マラリア・コントロール・プログラム」国際共同研究の中間報告書の一部である。

**キーワード** Malaria Outbreak, Malaria Control Program, community empowerment, Lombok Island, socio-epidemiological survey

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## I. INTRODUCTION

Roll Back Malaria program was launched by WHO in 1998, with stated goal to halve malaria deaths worldwide by 2010. In 2006, four years from the targeted year, malaria is still the most widespread and most serious parasitic disease in the world. It seems that the stated goal is still far from reality. Forty percent of the world's population, especially in tropical and subtropical countries, is exposed to the disease. The overall incidence of malaria in the areas at risk in the world was 396 million cases in 2001, of which more than 80% were on the African continent, leading to the death of 1,123,000 cases, mostly children. This condition forced WHO to state that Roll

Back Malaria program “is acting against a background of increasing malaria burden.”

The Roll Back Malaria that relied on the preventive and curative measures had several problems related to the difficulty of finding the most effective ways of prevention and treatment. Preventive measures deal with host, vector and environment. This varies greatly among parts of the world and even in a single endemic area. Malaria transmission is not homogenous throughout an endemic area but may be spotty and has various patterns. Curative measures deal with prompt and accurate diagnosis of each malaria case followed by treatment with an effective malaria drugs. Again problems are met; people have to face the lack of prompt and accurate diagnosis due to many factors and the growth of drug resistance strains of malaria.

Indonesia as a tropical country with an ideal environment for mosquitoes to breed and a large population to serve as reservoirs of parasites, faces the same problems with malaria. Most parts of Indonesia are considered moderate to high endemic areas. Based on the epidemiological patterns of malaria, Indonesia is stratified into Java and Bali islands (the inner islands) and the remainder of the archipelago is referred to as the outer islands, which includes Lombok island of West Nusa Tenggara province. In general, West Nusa Tenggara province is categorized as medium endemicity area of malaria. However, some areas of West Nusa Tenggara are high endemicity areas. The local health office considers this as an important problem as the risk of serious outbreaks is high. For example, in 2005 there was a nationally publicized malaria outbreak in East Lombok. Considering the magnitude of this problem, local health offices stated a goal of improving the health of the West Nusa Tenggara community by controlling the incidence of malaria.

The Malaria Control Program in West Nusa Tenggara was then implemented. Like other areas in Indonesia, Roll Back Malaria in West Nusa Tenggara did not differ in regard to vector control activities, consisting of house spraying, biological control, larvacide, source reduction, environmental management, and impregnated bed nets. However, different strategies for early detection were applied. In the Java and Bali islands, early detection is carried out by means of active and passive case detection (ACD, PCD) ; mass fever surveys (MFS) , epidemiological investigations (EPID) , follow-up, and surveys of migration. In contrast, in West Nusa Tenggara only PCD and malariometric surveys were undertaken.

The Malaria Control Program also faced different problems compared to other area of Indonesia. West Nusa Tenggara is not as prosperous as some other areas in Indonesia. Many citizens of West Nusa Tenggara worked as migrant laborers in other areas of Indonesia or even other countries. The human development index is also low, the lowest in Indonesia. The nature of the environment is ideal for vector breeding and there is a serious lack of community awareness related to malaria and malaria control. The program faced several problems namely declining stakeholder involvement in breeding site control, highly mobile population, budget constraints for malaria control and low proportion of blood taking for diagnosis by microscopy or rapid test.

Due to the increasing malaria burden, the Malaria Control Program in West Nusa Tenggara

needs to be revitalized with an integrated approach comprising preventive measures, including host, vector, environments, and curative measures, including early diagnosis and prompt treatment. Malaria Control Program have to be selected by considering social, economy, cultural and religious aspects that the community is willing to adopt them in daily life.

## II. OBJECTIVES of Malaria Control Program

The general objective is to investigate correlation social, economic, culture and religious aspects related with malaria transmission with incidences of malaria.

The specific objectives are to:

- Identify the social, economic, cultural and religious characteristics of the community
- Investigate the difference pattern on malaria transmission aspect between high density and low density population.
- Investigate the difference pattern on malaria transmission aspect in high endemicity and moderate endemicity population
- Investigate knowledge and behaviour aspects of the community
- Investigate knowledge, behaviour, perception and participation in past malaria control program among community leaders

## III. METHODS of Malaria Control Program

### 1 . Study Area and Population

East Lombok covers a total area of about 3,498.5 square kilometers, nearly 1,605.5 square kilometers land and 1,654.15 square kilometers sea with 220 kilometer coastline. East Lombok has tropical climate with highest rainfall of 281 mm in December and lowest rainfall of 2 mm in August. Mean annual rainfall is 1,218.50 mm. East Lombok population increased from 370.92/km<sup>2</sup> in 1995 to 598.16/km<sup>2</sup> in 2000. Annual income per capita is about USD 300 which mainly came from agricultural sector.

Population at risk of acquiring malaria and targeted by this project are in the Pijot and Tanjung Luar villages in Keruak district, Sukaraja and Batu Nampar village in Jerowaru district of East Lombok. Pijot village is approximately 6.8/km<sup>2</sup> densely inhabited by 6017 people. Tanjung Luar village is a smaller village, approximately 2.36/km<sup>2</sup>, but has nearly twofold as many inhabitants as Pijot village 12,383 people. Batu Nampar village is approximately 9.24/km<sup>2</sup> with 2,486 people. Sukaraja village approximately 14.34/km<sup>2</sup> with 10,100 people.

The two villages of Keruak district, Pijot and Tanjung Luar, have high Annual Malaria Incidence (AMI) : 100.8 per thousand in Pijot, and 65.5 per thousand in Tanjung Luar. The Annual Malaria Incidence in Jerowaru district is somewhat lower, with the highest AMI in Batu Nampar of 40.6 per thousand and in Sukaraja 14.2 per thousand.

East Lombok people have a relatively low level of education; 80% of the population has had no more than elementary school education. The role of informal leaders, especially the religious leader, called Tuan Guru, is significant in the community in almost all aspects of daily living. The Keruak and Jerowaru districts have a hilly contour with long inland rivers and lagoons in coastal area, an environment highly favorable for mosquito breeding.

## 2 . Study Design

This comparative study consists of two phases. A quantitative research will be conducted through in-depth interviews by authors with local people in concerned districts of East Lombok, using secondary data from health offices and primary healthcare facilities and comparing the interview information with primary surveillance to explore all the aspects of community information.

A qualitative research will be examined as “Collecting Baseline Data and Epidemiological /Sociological Survey (CBDESS) .” This cross sectional study uses Annual Malaria index (AMI) as dependent variable. The independent variables are socio-economy, cultural and religious aspects of community. The CBDESS analysis consists of malaria trends, socio-demographic, economic, cultural and religious characteristics, community involvement in Malaria programs and community knowledge and behavior related to malaria transmission in the subdistricts of Keruak and Jerowaru.

Malaria parameters in this survey are incidence, Annual Blood examination Rate (ABER) , Slide Positive Rate (SPR) , percentage of *P. falcifarum* (%Pf) , Dipstick positive Rate (DPR) , Annual parasite index (API) that be collected from secondary data. The socio-economic data will include population demographics: number, age, sex, level of education, occupation, health indexes such as child morbidity and mortality, maternal morbidity and mortality rate, social activity, income, expenses (including malaria prevention expenses) , ownership, and migrant laborers activity. The knowledge and behaviour data will include health-seeking preferences and malaria-specific knowledge. Local custom, culture and religion of the community will be observed to reveal the possibility of developing new approach to implement the preventive measures in the community.

Most of the preventive measures in the malaria control program need community involvement. To gain community involvement, a specific approach to the community is needed by considering all aspects of community characteristics.

This CBDESS survey will use two questionnaires; Quantitative questionnaire for identifying all aspect on socio-economy, cultural and religious and knowledge and behaviour related with malaria for community members, and qualitative questionnaire for identifying those aspect of community leaders. The qualitative survey will also identifying knowledge, perception and participation community leader in previous malaria control program in the concerned community. To gain such data, in-depth interview with community leaders and selected community members in and

from the four villages will be conducted. In-depth interview will be carried out by the authors and trained investigators to minimize the risk of bias.

This CBDESS survey will use two stage cluster random sampling, with endemicity as cluster. In precision rate 1 %, confidence level 99 % and proportion 0.0172 (taken from AMI in East Lombok) minimal sample is 936.

## **VI. Interviews on Sociological Aspects of Malaria Control Program**

This field note is an in-depth interview record of local people in Malaria infectious areas of East Lombok, carried out in July 27 – August 1, 2006.

### **[ 1 ] Tuan Guru H. Sibawahi (Religion leader) , Jerowaru village, Jerowaru Sub District, East Lombok (July 27, 2006)**

Assistance in terms of knowledge, experiences and even supplies could help to improve the prosperity and health of Lombok people. Jerowaru village is susceptible for malaria particularly during rainy season. Program should be addressed not only for malaria control but also for improvement of educational and prosperity status of the community.

According to Moslem believes: Human being is social creature that will gain support or thrust if his behavior is accordance with the local custom. Every task or occupation should be done by the master in it. If you say or plan something, then do it. If you can't do it, hand it to the one capable in it. Do all your work not for money or any other reasons, but merely because of God. Nature and human being is one, human being can't live without the nature, and the nature wouldn't be arranged well without human being. Human can rule the land as it wishes. Running a program needs collaboration to be successful; however, the program itself won't be successful without God promises.

There are 4 pillars to create a prosperous and peaceful world:

- 1 ) fair leaders, 2 ) knowledge of religious leader and scientist, 3 ) generosity of the rich,
- 4 ) hard work and pray of the poor

### **[ 2 ] Medical staffs & Malaria officers from district health office, Puskesmas Kruak (Community Health Center) , Kruak Sub-district, East Lombok (July 31, 2006)**

This facility is an old one, established in 1979, responsible to provide assistance to 4 villages, i.e. Selebung Ketangga, Pijot, Sepit, and Tanjung Luar villages. The number of people to reach by this facility is 47,557 people, with a good access of transportation. The furthest village from Puskesmas Kruak is Maringkik Island, which can be reached by boat for 1 hour. In that island, there are 400 households with a high prevalence of malaria. The number of people living in poverty is 10,935 (23%) people. Most the populations in Kruak Sub-District work as farm laborers and fishermen.

Table 1 . Population number in every village in Kruak Sub District

NO	VILLAGE	MALE	FEMALE	TOTAL
1	Sel. Ketangga	7,308	8,589	15,897
2	Pijjot	2,822	3,351	6,173
3	Tanjung Luar	5,991	6,389	12,380
4	Sepit	6,421	6,080	13,108
	Total	22,542	25,016	47,558

Clean water access remains a major concern in 2 villages, i.e. Pijot and Tanjung Luar villages, though pipe water is already available for several households. In other villages, the source of clean water is also available from wells. Pipe water is usually streamed to a container which is utilized by several households.

Table 2 . Clean water and latrine facility coverage

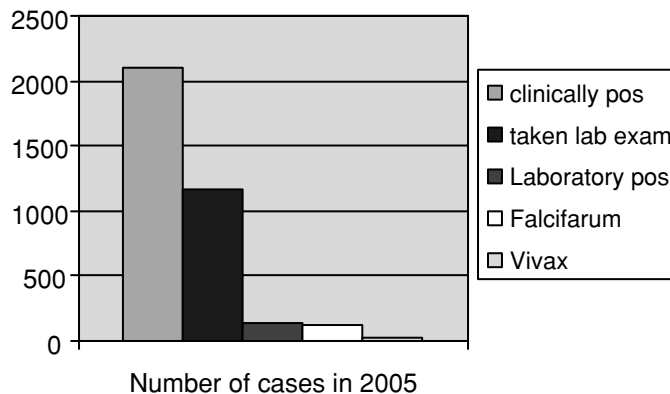
NO	VILLAGE	CLEANWATER (%)	LATRINE (%)
1	Sel. Ketangga	68.7	59.1
2	Pijjot	60.2	33.2
3	Tanjung Luar	39.3	27.3
4	Sepit	54.2	15.8
	Total	55.7	65

There is one public health facility (Puskesmas) with 3 supporting facilities located in Pijot, Tanjung Luar, and Sepit villages. There are 2 medical doctors, 14 nurses, and 7 midwives in this facility. Near by Puskesmas Keruak, there is a private clinic run by private medical doctor. Laboratory facility is equipped with trained lab technician and well functioning devices, including for malaria examination. Rapid diagnostic test (Paracheck®) is available in this facility which is capable of detecting Plasmodium falcifarum.

Malaria cases were found to be endemic in Pijot and Tanjung Luar village. Diagnosis was made based on laboratory and RDT examination. AMI in this sub-district reached 47.4% in 2005 and more than 50% of all cases came from Pijot and Tanjung Luar villages. There were 2107 clinically positive malaria cases, and among those patients, 1169 patients were equipped with blood examination. Only 11.8% were malaria positive on laboratory examination (P. falcifarum 118 cases, P. vivax 20 cases) . The major mosquitoes breeding places in endemic villages are lagoons.

During 2005, there was malaria outbreak in Pijot and Tanjung Luar village. This outbreak was mainly because of community mobilization. A lot of people in this sub-district work in other places, e.g. Korleko village. The first malaria case in 2005 was identified in Korleko village, Ijo Balit sub village, where limestone mining activity exists. Malaria was transmitted to another vil-

Figure 1. Malaria cases in Puskesmas Kruak, 2005



lage and sub-district in accordance with community mobilization.

Malaria eradication program has been conducted for years through different approaches, including environmental control, early diagnosis and prompt treatment, and community education. However, malaria still becomes a major threat to local people.

East Lombok DHO has distributed insecticide bed nets to all Puskesmas, however, the number is very limited. In this Puskesmas, bed net is only used for in patient treatment and not distributed to community members, while in other Puskesmas, bed nets are distributed widely. Other means of malaria control such as spreading fish and pouring insecticide (*Bacillus thuringiensis*) into lagoon, didn't work well. Villagers usually go fishing or even catch the fish with a casting net. This is generally true for lagoon that located far away from villagers'house. Lagoons were only cleaned for algae for 3 times in one month during rainy season. However, this activity takes a lot of cost since the community doesn't feel that clearing the lagoon will be beneficial to them.

### [3] Dr. Nunuk (Owner and physician of the private clinic), Kruak Sub-district, East Lombok (July 31, 2006)

She is 39 years old, came from Jakarta. She worked in Lombok in Mataram general hospital since 1993 as part of her duty to serve the country. After 3 years serving the country, she moved to Keruak Sub-district, East Lombok, and started to work as private practitioner. After 3 years working, she decided to build a private clinic under the suggestion of the local community. Until now, there are 40-60 more patients coming to her clinic every day. She experiences that the majority of her patients are suffered from respiratory tract infection, malaria and typhoid.

She always gets up early in the morning, taking care of her children before they attend the school. At 8.15-12.00 am and 4.00-9.00 pm, she works in the clinic. The rest of the times are used for her family.

According to her, family planning coverage is showing an improvement day by day. Sixty per-



cent among her patients have a good awareness to control birth. Routine counseling and community education will increase their awareness on certain issue regarding health.

She believes that malaria is highly related to community knowledge and practice. Approach to eradicate malaria should be addressed to educate the community. In order to accomplish this task, other sector should be involved, particularly religious leader, since the community is still socially bounded with religious activities. Other means of community education could also be delivered through health care in Posyandu, and local community organization such as PKK. The following barriers might exist in implementing malaria control program:

#### **Community level of education**

Most Keruak people are poorly educated. There is less than 60% of the community that completed the Junior High School. Low educational level leads to difficulty in receiving new inputs. Health promotion should be adjusted with local educational level.

#### **Natural borne factor**

There are a lot of low land areas in Keruak. Whenever rainy season or high wave comes, there will be more areas flooded with water.

#### **Shrimp ponds and abandon ponds**

These ponds provide another challenge in controlling malaria, since shrimp does not eat mosquito larvae and if fish were added into the shrimp ponds, fish will take the shrimp.

#### **[ 4 ] Ms. Ana Anisa (PKK member: women empowerment group) , Kruak Sub-district, East Lombok (July 31, 2006)**

She is 44 years old, came from Kupang, East Nusa Tenggara. She moved into Lombok in 2000 because her husband was being transferred from Kupang to Central Lombok. She is actively involved in empowering woman in the community. When she got here, woman has no power and rule in the community. No woman was invited or attended any community meeting. She is the first woman to participate in community organization.

PKK is a family empowering organization run by woman. There is no limitation in age or marital status. Every adult woman can be the member of PKK, either single or married. The organization structure is complex; starting at the national level to the lowest group in the community, i.e. part of a sub village. In every level, the chair is the wife of the first person in that level, e.g. governor wife for provincial level. Though there is no statement in the organization rule and policy that compel the wife of the first person in every level to be the chair of PKK in that level, it's already become a custom in this organization to decide who will be the chairperson. This policy is needed to assure the fund received from government office at every level. In her village (Sepit village) , they received 2 million rupiahs in 2005 from government village office. The number of fund received by every PKK, varies depending on the availability of government budget and organization activities. However, the number of fund received by every PKK in every sub district in East Lombok in 2005 is the same, 4 million rupiahs.

PKK is working in 10 major fields, i.e. 1) Pancasila (national ideology) understanding and implementation and elicit cooperation in the community; 2) Improving community education and skills; 3) community clothing; 4) food security; 5) community health; 6) organizational structure; 7) rising economic enterprise (koperasi); 8) living environment; and 9) healthy planning in the family. Not all PKK has an obvious activity for the community, some of them only gathering together without any activity. However, PKK in her village is very active and has a lot of activities in education and health promotion. They currently run early education for children 3-6 year old. The community shows big enthusiasms so that they are willing to buy the school chair. Other form of education is illiteracy campaign by providing school study for illiterate people. This activity runs under coordination with community learning center (PKBM) in the village.

In terms of economic development, she endorses the member to keep certain amount of money and lend it for economic activity conducted by the member. Until now, PKK is able to manage a small economic enterprise (koperasi) and the members are equipped with skills to make cookies and other family product that can be sold.

PKK also helps the socialization of healthy water to drink by introducing the SODIS approach. This approach utilizes a bottle of water and a piece of fabric material. The bottle is dried in the sun above the black fabric material for 5-6 hours. After that, it is ready to consume. This approach responds positively by the community. Before it started, they never drank cooked hot water.

Even in 2000, the community in her village relied mostly on traditional healer whenever they got sick. She tried to endorse them to visit medical doctor by talking with the family day to day. Now, most of the people prefer to visit medical doctor rather than traditional healer.

During her stay in Lombok, she notices a big different culture with Kupang in terms of gender issues. In Kupang, male and female has the same position in education and participation in community activities. She doesn't find that kind of culture in Lombok. Female is kept powerless, never participated in community activities, and had less chance to attend formal education still now.

**[5] Dr. Sachariadi (Head, Puskesmas Labuan Haji) , Labuan Haji Sub-district, East Lombok (August 1, 2006)**

Puskesmas Labuan Haji is responsible for the development of community health within 3 villages, i.e. Labuan Haji, Penada Gandor, and Suryawati villages, with a total of 42 sub villages. Most of the area is flat land and one third of it lies along the seashore. The total population number is approximately 30,000 people.

During 2005 there was an outbreak of malaria cases in the coastal area of the 3 villages. There was also an outbreak of malaria in 2003 and the last year outbreak was more difficult to control. Community education and environmental control conducted in 2003 to provide a reliable management of malaria outbreak. However, these approaches didn't work well for 2005 case. At least

there were three main reasons why this outbreak was difficult to be controlled: Natural change in terms of climate pattern. There were longer period of dry season, followed by a longer period of wet season.

The outbreak control did not perform constantly with other Puskesmas. This is very important because Puskesmas Labuan Haji is surrounded by area of endemic malaria. Lack of budget made it difficult to provide reliable approach to control the outbreak.

The majority (60-80%) of the people in Puskesmas Labuan Haji are living under poverty level with daily income which varies from Rp. 5,000 – Rp. 10,000 (approximately 70-140 JYN). The average of working days is 20 days per month. Most of the community work as farm labourers and some of them who live in the seashore work as fishermen. The social bound is good in terms of religious activities. However, other forms of social activities were not accompanied with a good response by the community including in health sector. Toilet facilities coverage reached 50-60% and clean water resource only available in 60-70% of community houses. Participation of community and religious leader is good whenever there is money to support their participation. However, there is no community or religious leader that has absolute power to provoke or motivate the community like that in Jerowaru and Keruak sub-districts.

**[6] Ms.Murnihat (53 years old, staff of Puskesmas Labuan Haji) , Kembang kuning, Teros, Labuan Haji, East Lombok (August 1, 2006)**

Mother daily activities are the same as other sub-districts visited the day before. Some mothers in this sub-district also work as a government employee. They usually wake up at 5.00 am and start with cleaning the house and cooking for the family. At 08.00 they go to work until 2.00 pm. The rest of the time is provided for the family. Mrs. Murnihati's husband has passed away 10 years ago. She has 4 children and only her last daughter accompanies her at home. She is sitting in the second grade of senior high school. The rest of her children are attended at university in Bogor and Mataram.

When her husband was still alive, it wasn't quite difficult to fulfill her family needs. Her husband is a good father. He didn't mind helping her to cook, wash clothes and bathing the children. Indeed, household work is the responsibility of the mother, while the husband working hard outside the house. The household economy is usually controlled by the father. Mother only engages to manage necessary household expenses.

Awareness on birth control is excellent in her community. People understand well that by controlling birth, the prosperity of their family would grow better. Contraception that is commonly accepted in the community is pills and injection. There are very few of people that use IUD. Family planning educator is the person in charge of distributing educational information on family planning to the community. The community members are usually gathered in public building in the village before the elucidation starts. The information is also provided in other social gathering, e.g. PKK meeting, and also during Posyandu activity.

Generally, community education on malaria is conducted whenever there is a malaria outbreak happens. This education followed by distributing mosquito net for free for the community with the highest incidence of malaria. Medical staff is already aware that malaria eradication would be best performed with community empowering activities, since malaria is related with local habit and custom. For example, the community member usually bathes in the open at the same period of mosquito biting time, usually during sun set (5.00 – 7.00 pm).

**[ 7 ] Ms. Inaq Sabri (Community member) , Padak sub village, Peneda Gandor village, Labuan Haji Sub District, East Lombok (August 1 , 2006)**

She is a 70 year old, widow, who lives in a small house in Padak sub village, Peneda Gandor village. She lives alone and collects buoyed lime stone to earn her livelihood. Her income is Rp. 25,000 (approximately 350 JYN) per month. She has two sons and one daughter, and all of them have got married and live in their own house. She never receives any support from her children. For daily living, she buys rice in the shop only when she has already gotten some money. She picks up vegetables from her field surrounding and sometime asks a fish from the fisherman since she doesn't have enough money to buy vegetables and fish.

She received bed net on January 2006. She feels very happy and proud using the bed net since she doesn't have to buy mosquito coil every day.

**ACKNOWLEDGEMENT**

This study was financially supported by Japan Society for the Promotion of Science (JSPS) and Bukkyo University.

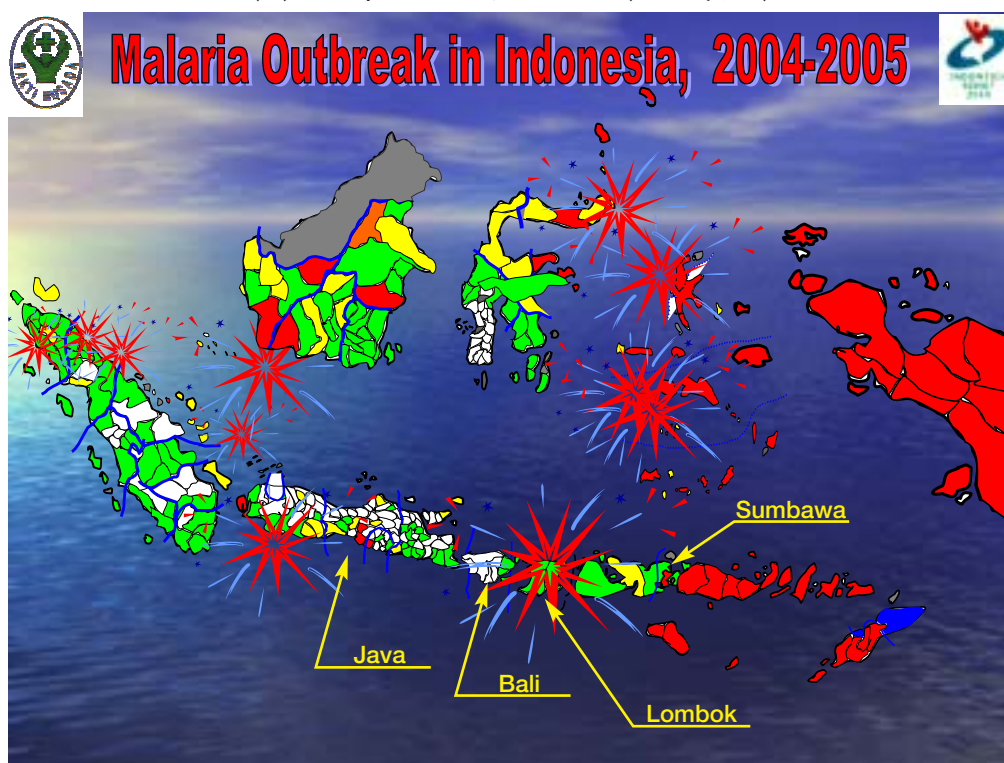
**APPENDIX: Notes on Photos of Malaria Control Program in East Lombok and Sumbawa, Indonesia**

- (1) The outbreak of Malaria in Indonesia and Lombok in 2004-05
- (2) Malaria infant patient in Kurowaru community health center (July, 2006)
- (3) Jerowaru community health center and its staffs (July, 2006)
- (4) Malaria Diagnosis Tests at 2<sup>nd</sup> Jerowaru primary school (July, 2006)
- (5) Collecting mosquito larvae at a lagoon of Peneda Gandor village, Labuan Haji, Lombok
- (6) A donation activity of Malaria Diagnosis Test at Bungin Island community health center (May, 2007)
- (7) A training workshop for CBDESS staffs (Malaria Village Workers) at Mataram University, Lombok
- (8) CBDESS research team and a principal investigator of MCP, Prof. Dr. Mitsuda

(みつだ ひさよし 公共政策学科)

2007 年 3 月 26 日受理

(1) 2005年マラリアアウトブレイク (インドネシア)



(2) マラリアに罹患した子供 (クロワク地域健康診療所, ロンボク島 2006年7月)





(3) ジェロワル地域健康診療所, ロンボク島 (2006 年 8 月)



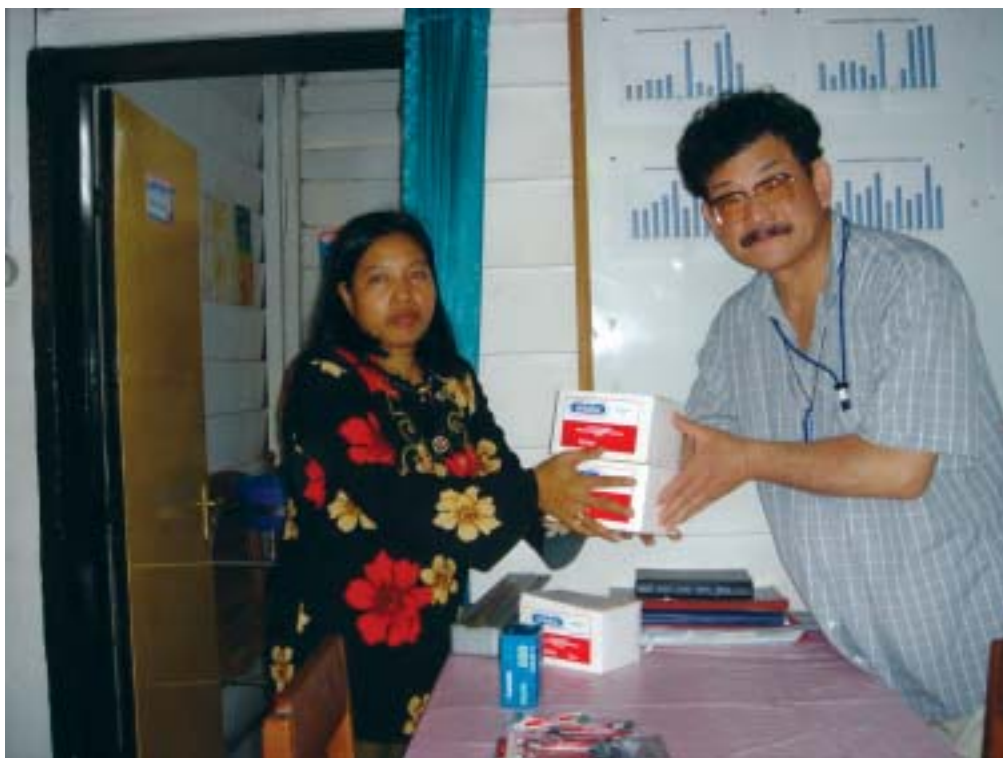
(4) マラリア血液診断テスト実施風景 (ジェロワル第2小学校, ロンボク島, 2006 年 8 月)



(5) ラグーンでのボーフラ採取 (ベネダ・ガンダー村, ラブアンハジ地域, 東ロンボク, 2006年8月)



(6) マラリア診断キットの贈呈 (ブンギン地域健康診療所, スンバワ島, 2008年5月)





(7) CBDESS 調査員 (Malaria Village Worker) 研修風景 (マクラム大学医学部, 2006 年 11 月)



(8) CBDESS 調査スタッフ (マタラム大学医学部ドクターたち, 2006 年 8 月)

